# ARGONNE NATIONAL LABORATORY

INTRA-LABORATORY MEMO

**Advanced Photon Source**

August 13, 2004

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| **To:** | J.M. Gibson | ALD APS |
| **From:** | J. Alicz | XFD ADM |
| | E. Chang | AOD ADM |
| | J. Lang | ASD ADM |

**Subject: Status of APS Follow up to the 2BM Incident Recommendations**

The APS Division ESH Coordinators performed an assessment of the response to the 2-BM Shutter Incident Assessment completed in August 2003, at the request of the APS ALD. The focus of the assessment was on the actions taken in the Beamlines /Front-Ends area and Accelerator systems.

The recommendations from the investigation and management report were consolidated in the September 2, 2003 Report "Management Evaluation of Work Practices Associated with Beamline Critical Components." The recommendations focused on the beamlines and front ends while also recommending work practices for all critical components. In spite of the absence of a general distribution of the 2BM reports or a formalized action plan developed some efforts were made by each of the divisions to address elements of the recommendations.

For the purpose of this assessment these recommendations have been categorized focusing on:

- Responsibility/oversight
- Documentation
- Work Flow
- Hardware

<u>Responsibility:</u>

Recommendation: APS management should assume responsibility for the maintenance and repair of all beamline critical components once they become part of a beamline, making it clear who is responsible for subsequent maintenance and repair.

Front Ends and Beamlines Status:

AOD assigned Mohan Ramanathan the duty of Critical Component Systems Manager (CCSM). His PD was rewritten to include the new role. The role is a direct report to the AOD Director. The CCSM delivers quarterly reports to the Ops Directorate. In addition a policy for work on beamline shielding components including CCSM approval was established in October 2003. In April 2004

ASD issued a memo to its group leaders on the interim policy for work on critical components in the front ends and beamlines.

Accelerator Status:

A misunderstanding existed in which ASD assumed that the AOD chief of operations for the Injectors had CCSM duties. This was not the case. Since the LEUTL radiation stop incident ASD has assigned temporary authorization for work on critical components in the accelerators to the ASD-ADDs.

Documentation

Recommendation: The APS should develop a procedure that clearly defines the control and workflow during maintenance or repair of critical components. The procedure should specify approval to perform work, identify oversight, training requirements and spell out the validation process required for resumption of beamline operations.

Recommendation: Documentation for critical beamline components should be archived in the Document Control Center. To expedite the collection of this information one individual should be assigned this task.

Front ends and Beamlines Status:

The ASD-SI web document describing the Mode Control Logic for P4 and P6 Shutters was updated in September 2002 to clarify the functionality of the shutter systems as indicated by the PSS control and display panels. On February 24, 2004, a committee was formed to determine the status of documentation for front end components and has met seven times. The committee's initial focus has been on the drawings. XFD has initiated specific interface control documents (ICDs) designating responsibilities for the canted undulator front-end shutters. PSS procedures were reviewed, and the sections on front-end shutter checkouts were expanded. No specific actions were taken to address the manner in which work is planned, executed and validated.

The CCSM has undertaken the responsibility of collecting pertinent documentation.

Accelerator Status:

Since the LEUTL incident a single sheet drawing of the functionality, interfaces, and essential hardware for the LEUTL radiation stop has been created. This work aid is being considered as a template for all critical components in the accelerator. A working group has assembled to collect and improve the mechanical and electrical interlock drawings for work on the accelerator beam and radiation stops. Drawings for the LEUTL stop, pneumatic circuit, ACIS circuits, and control boxes have been modified to clearly show how the device and the interlocks work and that the LEUTL stop is different from the other stops. ASD-SI is examining its validation procedures to identify and address any ambiguities.

Flow of Work

Recommendation: APS Management should ensure that all individuals responsible for installation, maintenance, and repair of critical components have the background and knowledge to work on critical components.

Recommendation: APS should modify the Work Request form to identify when a critical component is involved in the work to be done, in order to assure that the individuals assigned to perform the work apply relevant procedures.

Recommendation: APS should implement a Traveler to track work on critical components. The traveler should define the work to be performed by each group and require that each worker and supervisor involved in the work stipulate in writing that the work was completed according to procedure.

Front ends and Beamlines Status:

The Work Request System has been modified to include a "Front End" category and a yes/no "Critical Component" menu that both trigger CCSM notification for approval. XFD's ICDs identify at some level, the flow of work. ASD has created a Shutter Acceptance Checkout Procedure for work performed on front-end and beamline components by ASD-SI and ASD-Vac.

Accelerator Status:

ASD is refining a "Policy for Work on Critical Components."

Hardware

Recommendation: Future shutter designs should incorporate the means to assure that they have been correctly positioned after *in-situ* repairs are completed. Consideration should also be given to installing unique fittings for the pneumatic supply and return airlines to eliminate the potential for reversing the lines.

Front ends and Beamlines Status:

XFD's new shutter designs include external hard stops that function as a positive reference for alignment. In addition, the presence and proper functionality of all mode shutter kirk keys systems have been assured.

**Conclusion:**
The recommendations from the 2BM reports were focused on the front ends and beamlines. Therefore much of the APS response was focused on those areas.

- Processes are in place to gather the documentation appropriate to properly manage work on critical components.
- Some level of oversight has been established for work on critical components.
- APS is lacking a comprehensive definition and list of critical components.

- Development and review of critical components from the design phase through decommissioning needs more definition.
- The current work request system should be enhanced to better document and coordinate work on critical components.
- APS needs a formal critique and follow up process to address system failures and identified areas for improvement.

List of Interviewees:

Banks, G.
Barsz, T.
Carwardine, J.
DeCarlo, F.
Den Hartog, P.
Erdmann, M.
Fernandez, P.
Forrestal, J.
Friedsam, H.
Glagola, B.
Goeppner, G.
Hawkins, J.
Klaffky, R.
Leatherman, S.
Noonan, J.
Ramanathan, M.
Ruzicka, B.
Shu, D.
Vacca, J.
Wesolowski, B.

Cc: R. Gerig
E. Gluskin
R. Hislop
W. Ruzicka